Title: Induction of Moth Pheromone Production by Topical Application of an Amphiphilic Pseudopeptide Mimic of Pheromonotropic Neuropeptides.

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The production of sex pheromones in moth species is regulated pheromone biosynthesis activating neuropeptides (PBAN). The fact that sex pheromones are critical for reproductive success makes PBAN an ideal candidate for studies on the development of alternative strategies for pest control based on depletion of pheromone precursors or development of PBAN antagonists. These strategies require the development of a delivery system that allows for topical application of candidate neuropeptide mimetics or antagonists. The critical features of such a delivery system are that the peptides of interest must penetrate the hydrophobic lipidic surface of the insect cuticle while still maintaining bioactivity. In order to facilitate penetration of the insect cuticle an amphiphilic analog of the pheromonotropic peptide, EDGFTPRL-amide, was synthesized by addition of 6-phenylhexanoic acid to the amine terminus. This pseudopeptide mimic was found to have pheromonotropic activity equivalent to that of the native peptide when injected into moths. Additionally, the molecule was soluble in a variety of solvents including dimethyl sulfoxide, acetonitrile and water. Dose and time response studies indicated that application of the amphiphilic pseudopeptide in water induced pheromone production in as little as 15 minutes after application and that the effects were maintained for prolonged periods.

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